GANNETT HOMEOWNERS (PWS 5070086)
SOURCE WATER ASSESSMENT FINAL REPORT

March 29, 2004

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for the Gannett Homeowners, Blaine County, Idaho* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The Gannett Homeowners (PWS #5070086) drinking water system consists of two ground water well sources that are manifolded together and serve a population on 57 through 17 connections.

Well #1 and #2 have a moderate susceptibility rating to IOC, VOC, SOC, and microbial contamination. These ratings are due to a moderate rating in hydrologic sensitivity, a moderate rating for system construction, and a low number of potential contaminant sources.

The IOCs fluoride, nitrate, barium, chromium, and sodium have been detected in the well water, but at levels below the maximum contaminant levels (MCLs) for drinking water. There have been no detections of microbial contaminants since sampling was commenced. In addition, no VOCs or SOCs have ever been detected.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Gannett Homeowners, drinking water protection activities should first focus on maintaining the requirements of the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Any spill from

the potential contaminant sources listed in Table 1 of this report should be carefully monitored, as should any future development in the delineated areas. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Also, disinfection practices should be continued to keep microbial contamination from harming the water. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Most of the designated areas are outside the direct jurisdiction of the Gannett Homeowners.

Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land uses areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE GANNETT HOMEOWNERS, BLAINE COUNTY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the EPA to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments for sources active prior to 1999 were completed by May of 2003. SWAs for sources activated post-1999 are being developed on a case-by-case basis. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Gannett Homeowners has two community ground water wells manifolded together that serve approximately 57 people through approximately 17 connections (DEQ, 2003). Currently the Gannett Homeowners drinking water system consists of Wells #1 and #2 (Figure 1).

The IOCs fluoride, nitrate, barium, chromium, and sodium have been detected in the well water, but at levels below the maximum contaminant levels (MCLs) for drinking water. There have been no detections of microbial contaminants since sampling was commenced. In addition, no VOCs or SOCs have ever been detected.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Big Wood River aquifer in the vicinity of Gannett Homeowners. The computer model used site specific data, assimilated by DEQ from a variety of sources including the Gannett Homeowners well log, other local well logs, and various reports (detailed below). The actual data used by IDEQ in determining the source water assessment delineation area is available upon request.

General Big Wood River Hydrogeology

The geology of the region was described in detail by Umpleby et al. (1930) and was geologically mapped by Rember and Bennett (1979). The mountains in the area are composed of Pre-Cretaceous sedimentary and metamorphic rocks, Cretaceous granitic rocks, and Tertiary volcanic rocks. Extensive faulting and folding have resulted in complex structure (Luttrell and Brockway, 1984). Terraces in the area are composed of alluvial deposits.

The water bearing alluvial sediments that fill the Big Wood River Valley are of Quarternary age. Most of the valley fill is stream and delta clay, sand, and gravel. A relatively thin sheet of coarse fluvioglacial sediments overlies and alluvium. The fluvioglacial deposit is thickest around Hailey and thins to the south. Local well logs show thicknesses in excess of 300 feet. Shallow dug wells yield large amounts of ground water from the alluvium, though the pumping of wells near the river induces rapid infiltration of river water. The slope wash deposits of the higher altitudes in the mountains is not an important source of water, but the sediments readily transmit water to the alluvium in the lowland valley (Smith, 1959).

Precipitation data were collected at Hailey from 1917 to 1982 and at Sun Valley from 1937 to 1973. Mean annual precipitation for the 1940-79 base period was 16.0 inches at Hailey and 17.5 inches at Sun Valley/Ketchum. The mean annual precipitation for Warm Springs Creek at 7,660 feet altitude in 28 inches (Frenzel, 1989).

Major tributaries to the Big Wood River include the North Fork Big Wood River, Trail Creek, Warm Springs Creek, and East Fork Big Wood River. Surface water and ground water are interconnected in the basin. The Big Wood River gains or losses water based on local conditions and seasonal factors. Transmissivity (T), equal to the hydraulic conductivity (K) multiplied by the thickness of the aquifer (b) was estimated using specific capacity tests of six wells with a minimum pumping rate of 500 gpm and a minimum pumping time of 2 hours (Frenzel, 1989). The resulting T was averaged at 13,300 $feet^2$/day. K averaged 150 to 300 feet/day. Tested City of Hailey wells resulted in K values of 310 to 490 feet/day.

City of Picabo (south end of model)

Ground water in the middle Big Wood River-Silver Creek basin occurs under both unconfined and confined conditions. Much of the ground water in the southern part of the basin lowlands is confined, and some deep wells in the area flow artesian. The confined aquifers consist of fine- to medium-grained gravel in a sand matrix and the confining beds are relatively impermeable clay and silt. The confining beds are not impermeable, allowing some upward leakage that joins the unconfined water and maintains the shallow water table. The shallow water feeds the springs and swamps in the southern part of the basin. A large share of the underflow moves southeastward and much of it is discharged by wells and by springs and seeps that feed Silver Creek. A local pumping test resulted in a transmissivity of greater than 100,000 ft^2/day. (Smith, 1959).

Gannett Homeowners delineation specifics

No flow boundaries were placed at the boundary of the valley alluvium and the mountains to either side. In the up-gradient direction, the model was ended just north of Hailey. In the down-gradient direction, the model was ended southeast of Picabo. The water table contours were constrained in the model by using topographic maps to define the levels in the Big Wood River and Silver Creek.

In the up-gradient direction, K values range from 150 to 300 feet/day in the valley as a whole, average 135 feet/day in the area of Bellevue, and range from 310 to 490 feet/day in the area of the City of Hailey. Thickness (b) values range from 150 to 190 feet. In the down-gradient direction, K values range from 10 feet/day to 125 feet/day and b values range from 100 to 150 feet.

Local area well logs near Gannett with legitimate pumping tests were few, but those that were available showed a range of K values from 80 to 350 feet/day. As the wells in the Gannett area rarely exceed 70 feet, the maximum b value is 65 feet with a low end of 40 feet.

In addition to the Gannett Homeowners wells, there a number of irrigation wells in the area that could cause well interference effects. Local irrigation wells were added and pumped during the simulations. As the irrigation wells likely do not pump during the off season, simulations were also run during a zero recharge scenario. Irrigation wells and test point wells were collected from IDWR files.

The delineated source water assessment areas for the Gannett Homeowners have been combined for Wells #1 and #2 because they have a similar location. The delineation can best be described as an approximate oval that is bounded to the northeast by the edge of the valley and extends to the northwest along Highway 75 (Figure 2). The final delineation is a composite of the irrigation and non-irrigation simulations. The actual data used by WGI and DEQ in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation area were obtained by field surveys conducted by DEQ, the Gannett Homeowners Association operator, and from available databases.

The dominant land use outside the Gannett Homeowners area is irrigated agriculture. Land use within the immediate area of the wellheads consists of residential property, commercial and light industrial, and agricultural.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted in late summer 2003. This involved identifying and documenting potential contaminant sources within the Gannett Homeowners source water assessment areas through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ in 1998 and 1999. The second, or enhanced, phase of the contaminant inventory is included to allow local operators to update the information to a current state. For Gannett Homeowners, system representative Joel Hall verified DEQs information.

Since Well #1 and #2 have the same delineation, they share the same number of potential contaminant sources (Table 1, Figure 2). The delineation is crossed by Highway 75 in all three TOTs. If an accidental spill occurred on the Highway where it crosses the delineation, IOCs, VOCs, SOCs, or microbial contaminants could be added to the aquifer system.

Table 1. Gannett Homeowners Wells #1 and #2, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
	Highway 25	0-10	GIS Map	IOC, VOC, SOC, Microbial

[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity was moderate for the wells (see Table 2). Regional soils data classifies the delineated area as encompassing predominantly poor to moderately-drained soil. Available well logs showed that the vadose zone is composed of a mixture of clay, hardpan, gravel, and sand. The well logs also show that there are insufficient low permeability zones between the land surface and the water table. The depth to the first water, at the time of drilling, was between 25 and 30 feet below ground surface (bgs) in 1991.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The Gannett Homeowners drinking water system consists of two wells that extract ground water for community uses. Both wells rate moderate susceptibility for system construction. The 2000 sanitary survey found that the wellheads and surface seals were maintained and protected from surface flooding.

Completed in 1991, Wells #1 and #2 are drilled to a depth of 65 feet below ground surface (bgs). Steel casing was installed using a 0.250-inch thick, 8-inch diameter casing set to a depth of 60 feet bgs into "gravel and sand." Neither well is screened. The original static water level in 1991 was at 17 feet bgs. The cement grout and bentonite annular seals were set to 20 feet bgs into "gravel and sand." A 1-hour specific capacity test was completed on each well.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thickness, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Eight-inch or greater diameter wells require a casing thickness of at least 0.322-inches. Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5 times the design pumping rate. Casing is required to be sealed to a minimum of 18 feet bgs if there is a low permeability layer at that depth. Otherwise, surface seals must be extended into low permeability or consolidated zones. The wells received an additional point in the system construction category because not all the well construction requirements were completed based on the information available.

Potential Contaminant Source and Land Use

Wells #1 and #2 rated moderate for IOCs (e.g., arsenic, nitrate), VOCs (e.g., petroleum products), and SOCs (e.g., pesticides), and low for microbial contaminants (e.g., bacteria) (Table 2). The transportation corridor and agricultural land uses add the most points to the land use scores.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, the storage or application of any potential contaminants within 50 feet of the wellhead will lead to an automatic high score. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, both wells rate moderate in all categories.

Table 2. Summary of the Gannett Homeowners Susceptibility Evaluation

Source	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	M	M	M	M	L	M	M	M	M	M
Well #2	M	M	M	M	L	M	M	M	M	M

[1]**H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility**
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, both wells rate moderate in all categories. Moderate hydrologic sensitivity and system construction and limited potential contaminant point sources keep the final scores lower despite the agricultural land uses of the area.

The IOCs fluoride, nitrate, barium, chromium, and sodium have been detected in the well water, but at levels below the MCLs for drinking water. There have been no detections of microbial contaminants since sampling was commenced. In addition, no VOCs or SOCs have ever been detected.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For the Gannett Homeowners, drinking water protection activities should first focus on maintaining the requirements of the sanitary survey. Any spill from the potential contaminant sources listed in Table 1 of this report should be carefully monitored, as should any future development in the delineated areas. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Also, disinfection practices should be continued to keep microbial contamination from harming the water. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Most of the designated areas are outside the direct jurisdiction of the Gannett Homeowners. Partnerships with state and local agencies and industry groups should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land uses areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the DEQ or the Idaho Rural Water Association.

If the Gannett Homeowners plans to expand further, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use. New PWS wells are required to follow the *Well Construction Standards Rules* (1993) and DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during well construction.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office	(208) 736-2190
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, (mlharper@idahoruralwater.com) Idaho Rural Water Association, at (208) 343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Brockway, C.E. and M.A. Kahlown. 1994. "*Hydrologic Evaluation of the Big Wood River – Silver Creek Watersheds*." Idaho Water Resources Research Institute. 77 pages.

Daly, C., and G.H. Taylor, 1998, www.climatesource.com.

Freeze, R.A., and J.A. Cherry, 1979, Groundwater, Prentice-Hall, Inc., 604 p.

Frenzel, S.A. 1989. "*Water Resources of the Upper Big Wood River Basin, Idaho*." U.S. Geological Survey. Water-Resources Investigations Report 89-4018. 47 pages.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "*Recommended Standards for Water Works*."

Idaho Department of Environmental Quality, 2000. *Sanitary Survey for the Gannett Homeowners.*

Idaho Department of Water Resources, 1993. *Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules*. IDAPA 37.03.09.

Idaho Division of Environmental Quality, 1999, *Idaho Source Water Assessment Plan*, October, 39 p.

Idaho Division of Environmental Quality, 1997, *Idaho Wellhead Protection Plan*, Idaho Wellhead Protection Work Group, February.

Idaho Division of Environmental Quality, 1997. *Design Standards for Public Drinking Water Systems*. IDAPA 58.01.08.550.01.

Jensen, M.E., M. Lowe, and M. Wireman, 1997, *Investigation of Hydrogeologic Mapping to Delineate Protection Zones around Springs, Report of Two Case Studies*, National Risk Management Research Laboratory, U.S. Environmental Protection Agency, EPA/600/R-97/023, 60 p.

Kraemer, S.R., H.M. Haitjema, and V.A. Kelson, 2000, *Working with WhAEM2000, Source Water Assessment for a Glacial Outwash Wellfield, Vincennes, Indiana*, National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, EPA/600/R-00/022, April, 50 pp.

Luttrell, S.P. and C.E. Brockway. 1984. "*Impacts of Individual On-Site Sewage Disposal Facilities on Mountain Valleys – Phase II – Water-Quality Considerations*". Research Technical Completion Report WRIP/371403. Idaho Water and Energy Resources Research Institute. University of Idaho. 74 pages.

Smith, R.O., 1959, "*Ground water Resources of the Middle Big Wood River-Silver Creek Area, Blaine County, Idaho*". U.S. Geological Survey Water-Supply Paper 1478.

Theis, C.V., 1935, *The Relation between Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Groundwater Storage*, Trans. Amer. Geophysical Union, v. 16, pp. 519-524.

Umpleby, J.B., Westgate, L.G., and Ross, C.P., 1930*, "Geology and ore deposits of the Wood River region, Idaho*", U.S. Geological Survey Bulletin B14, 250 p.

Attachment A

Gannett Homeowners Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name :GANNETT HOMEOWNERS Well# : WELL #1 and #2
Public Water System Number 5070086 12/11/2003 9:25:17 AM

1. System Construction		SCORE
Drill Date	08/1991	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2000
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
	Total System Construction Score	4

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
	Total Hydrologic Score	4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2

Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	1	1	1	1
(Score = # Sources X 2) 8 Points Maximum		2	2	2	2
Sources of Class II or III leacheable contaminants or	YES	5	1	1	
4 Points Maximum		4	1	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		10	7	7	6

Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0
Cumulative Potential Contaminant / Land Use Score		20	17	17	8

4. Final Susceptibility Source Score	12	11	11	11
5. Final Well Ranking	Moderate	Moderate	Moderate	Moderate